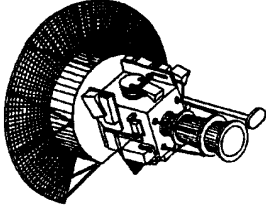# SME
Solar Mesosphere Explorer

Spacecraft Sketch	Mission Objective
	The primary mission (or scientific) objectives of the Solar Mesosphere Explorer (SME) are to: 1) Understand the nature and magnitude of changes in mesospheric ozone densities that are the result of changes in the solar ultraviolet flux; 2) understand the relationship between solar flux, ozone, and the temperature of the mesosphere; 3) understand the relationship between mesospheric ozone and water vapor; 3) understand (if a significant number of solar proton events occurs) the: a) relationship between the magnitude of decrease in ozone and the flux and energy of the solar protons; b) recovery rate of the ozone following the event; and c) role of water vapor in the solar proton destruction of ozone; 4) understand the stability of ozone against changes of any kind in mesospheric conditions; and 5) extend any increase in understanding of the mesospher into the stratosphere.

TYPE OF MISSION	PROGRAM OFFICE	PROJECT LEAD CENTER	MANAGEMENT APPROACH	S/C CONTRACTOR	I&T CONTRACTOR
ASTROPHYSICS	SPACE SCIENCE	JPL	OUT-OF-HOUSE	BASD	BASD

Payload Description

The Solar Mesosphere Explorer (SME) payload consists of an observatory module which contains the five science instruments and a spacecraft base module which performs all housekeeping functions for, and provides power to, the observatory module. The SME spacecraft is the first spinning satellite to use a totally autonomous attitude control system that could also be operated manually from the ground. The spacecraft body shape is a cylinder with a solar array disk mounted on the booster end. A notch in the solar array allows one instrument to look at the sun once every rotation. Science data is gathered in bursts once every satellite rotation, stored in the instruments and read out slowly into the SME data handling system. There the data is merged with engineering data and put into one of four selectable formats. The merged data stream is either transmitted in real time to a ground station or stored on one of two tape recorders for later playback.

INSTRUMENT NAME	ACRONYM	PI AFFILIATION	PRINCIPAL INVESTIGATOR	I&T CONTRACTOR
IR RADIOMETER	NONE	UNIV COLORADO	C. A. BARTH	UNIV COLORADO
UV SPECTROMETERS	NONE	UNIV COLORADO	C. A. BARTH	UNIV COLORADO

Instrument Descriptions
The SME IR Radiometer consists of four infrared (IR) channels. The four-channel radiometer/telescope has two filter-detector combinations which operate in the micrometer regions 6.1 to 7.2, 8.6 to 10.6, 14.7 to 15.7, and 13.2 to 17.2. The instrument views normal to the spin axis, with its field of view sweeping through the limb, sampling a succession of 20 elements of the atmosphere, each approximately 3.5 km in height at the earth's limb.
The SME UV Spectrometers, Data Point 650, are actually four separate spectrometers whose purpose was to provide spectrometer observation of the ozone layer and monitor incoming solar radiation. The four instruments were designed and built by the University of Colorado; cost data are not available for individual instruments because of accounting procedures used. Each instrument had a dual channel Ebert-Fastie Spectrometer but used different detectors to provide coverage of different spectral regions and resolutions.

Launch
10/6/81